DETAILED TECHNICAL NOTES

Population: Population figures are 2000 census counts from the United States Census Bureau, provided by the Wisconsin Division of Health Care Financing, Bureau of Health Information (BHI). Population is determined by county for three age groups and six race and ethnicity groups. Population counts are rounded to the nearest ten, and rounded county totals are summed to determine the state population.

Age Groups: Age groups utilized for this report include: 18-44 years, 45-64 years, and 65+ years. Although American Indian and Alaska Native prevalence rates are for 15-44 years, the rates are applied to the appropriate population 18-44 years (see the *American Indian and Alaska Native Prevalence* section below).

Race and Ethnicity Groups: The six race and ethnicity groups are: ① American Indian and Alaska Native, ② Hispanic, ③ Non-Hispanic Asian and Non-Hispanic Native Hawaiian and Other Pacific Islander, ④ Non-Hispanic Black, ⑤ Non-Hispanic White, and ⑥ Non-Hispanic Some Other Race and Non-Hispanic Two or More Races. Hispanic American Indian and Alaska Natives are included in the American Indian and Alaska Native population, but not in the Hispanic population. Hispanic persons include those who, in the 2000 census, identified themselves as one of the following: Hispanic Asian, Hispanic Black, Hispanic Native Hawaiian and Other Pacific Islander, Hispanic Some Other Race, Hispanic Two or More Races, and Hispanic White.

Estimated Diagnosed Prevalence: Prevalence is the number of cases of a disease that are present in a population during a specified time. Prevalence rates are presented for the age groups and race and ethnicity groups described above. Wisconsin-specific data were used when available; all other prevalence rates are based on national surveys. There are limitations to these data due to survey sample size of certain racial and ethnic groups in Wisconsin.

- *American Indian and Alaska Native Prevalence*
  Prevalence rates are from Great Lakes Inter-Tribal Council, Inc. (GLITC). GLITC obtained the prevalence rates from an unpublished 1999 Indian Health Service (IHS) report. IHS analyzed the data according to specialized methods.[1] GLITC provided county-specific rates for Menominee County. Prevalence rates are applied to the appropriate population in each county to determine an estimated number of American Indian and Alaska Native persons diagnosed with diabetes in each of the three age groups.

- *Hispanic Prevalence*
  Prevalence rates are from the United States Behavioral Risk Factor Surveillance System (BRFSS), 1994-1997.[2] Rates are applied to the appropriate population in each county to determine an estimated number of Hispanic persons diagnosed with diabetes in each of the three age groups.

- *Non-Hispanic Asian, Native Hawaiian, and Other Pacific Islander Prevalence*
  The prevalence rate is from the United States BRFSS, 1997.[3] This rate is applied to the appropriate population in each county to determine an estimated number of Non-Hispanic Asian, Native Hawaiian, and Other Pacific Islander persons diagnosed with diabetes in each of the three age groups.

- *Non-Hispanic Black Prevalence*
  Prevalence rates are from the Wisconsin Behavioral Risk Factor Survey (BRFS), 1997-2000. Rates are applied to the appropriate population in each county to determine an estimated number of Non-Hispanic Black persons diagnosed with diabetes in each of the three age groups.

- *Non-Hispanic White*
  Prevalence rates are from the Wisconsin BRFS, 1997-2000. Rates for the three age groups within each of the five Division of Public Health regions are presented. Region-specific rates are applied to the appropriate county's population (except for Milwaukee County) to determine an estimated number

of Non-Hispanic White persons diagnosed with diabetes in each of the three age groups. Milwaukee County-specific rates are applied to the appropriate population in Milwaukee County to determine the estimated number of Non-Hispanic White persons in Milwaukee County diagnosed with diabetes in each of the three age groups. The map on page 4 of the detailed technical notes displays counties and their corresponding regions.

- *Non-Hispanic Some Other Race and Two or More Races*
  In the 2000 census, over 26,500 persons in Wisconsin 18 years and above identified themselves as "Non-Hispanic Some Other Race" or "Non-Hispanic Two or More Races." Prevalence rates are from the Wisconsin BRFS, 1997-2000, and for this report, include all races and ethnicities. These rates are applied to the appropriate population in each county to determine an estimated number of persons identifying themselves as above diagnosed with diabetes in each of the three age groups.

For each county, the estimated number of persons in each age group diagnosed with diabetes is the rounded sum of the estimates of each of the six racial and ethnic groups in that particular age group. The three estimates are summed to provide an estimate for all adults. All county estimates are summed to determine state estimates. Percents of estimated diagnosed persons are calculated by dividing the numbers of diagnosed persons by the population; percents are rounded to the nearest whole percent.

Undiagnosed Prevalence: In the United States, an estimated 10.3 million persons have been diagnosed with diabetes, and 5.4 million persons have diabetes that has not been diagnosed.[4] This ratio of undiagnosed to diagnosed (5.4 million:10.3 million or 52.43%) is used in determining the estimated number of persons who have undiagnosed diabetes. Unrounded numbers of diagnosed persons are multiplied by the above ratio to determine the estimated number of persons who have undiagnosed diabetes in each age group and county. Rounded county estimates are summed to determine state estimates by age group. Percents of estimated undiagnosed persons are calculated by dividing the numbers of undiagnosed persons by the population; percents are rounded to the nearest whole percent.

Total Prevalence: County-specific rounded numbers of diagnosed persons and rounded numbers of undiagnosed persons are summed for each of the three age groups to determine the total estimated number of persons with diabetes by county. All county estimates are summed to determine state estimates. Percents of estimated totals are calculated by dividing the numbers of total persons by the population; percents are rounded to the nearest whole percent. In some cases, the total percents may not equal the sum of diagnosed percents and undiagnosed percents, due to rounding.

Hospitalizations: Hospitalization information is from the Wisconsin BHI 2000 Inpatient Hospital Discharge Database. These data include all ages (children as well as adults), but do not include hospitalizations at any Veteran's Administration (VA) hospitals, which are exempt from the state reporting requirements. Hospitalization records are based upon the county of residence of the person hospitalized – not the county where the person is hospitalized. Hospitalizations for non-Wisconsin residents and for Wisconsin residents hospitalized outside of Wisconsin are not included. For this report, diabetes-related hospitalizations are defined as the reporting of ICD-9 codes 250.0 – 250.93 in "Principal Diagnosis Code" or "Other Diagnosis Code" (eight separate lines). Those hospitalizations that report more than one diabetes code for one hospitalization are not counted twice.

The total number of hospitalizations is rounded and presented for each county. The total number of hospitalizations in Wisconsin is the sum of the county totals. The total number of diabetes-related hospitalizations is rounded and presented for each county. The total number of diabetes-related hospitalizations in Wisconsin is the sum of the county totals. Percents of diabetes-related hospitalizations are calculated for each county and for the state by dividing the rounded number of diabetes-related hospitalizations by the rounded total number of hospitalizations and percents are rounded to the nearest whole percent.

Charges (rounded to the nearest $1,000) for the total number of hospitalizations are presented for each county. The total charges for Wisconsin is the sum of the county charges. Charges (rounded to the nearest $1,000) for the total number of diabetes-related hospitalizations are presented for each county.

The total diabetes-related charges for Wisconsin is the sum of the county charges. Percents of diabetes-related charges are calculated for each county and for the state by dividing the diabetes-related charges by the total charges, and percents are rounded to the nearest whole percent.

Risk factors: All risk factor data are from 2000 Wisconsin BRFS, except for high blood pressure and high cholesterol, which are from the 1999 Wisconsin BRFS. Information on risk factors includes only those persons 18 years and older. Body mass index (BMI) is defined as weight in kilograms divided by height in meters squared (kg/m^2). For this report, obese is defined as a BMI of 30 kg/m^2 or above and overweight is defined as a BMI of 25 kg/m^2 or above. Therefore, the percentage of persons who are overweight includes those who are obese. The definition of high blood pressure is the percentage of persons who answered "Yes" to the question "Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?" The definition of high cholesterol is the percentage of persons who answered "Yes" to the question "Have you ever been told by a doctor or other health professional that your blood cholesterol is high?" The definition of lack of physical activity is less than 30 minutes of moderate physical activity most days of the week. The definition of current smoker is the percentage of persons who have ever smoked 100 cigarettes in their lifetime and reported smoking every day or some days. The definition of less than 5 servings of fruit/vegetables is the percentage of persons who report they do not consume five or more servings a day. All percentages are rounded to the nearest whole percent.

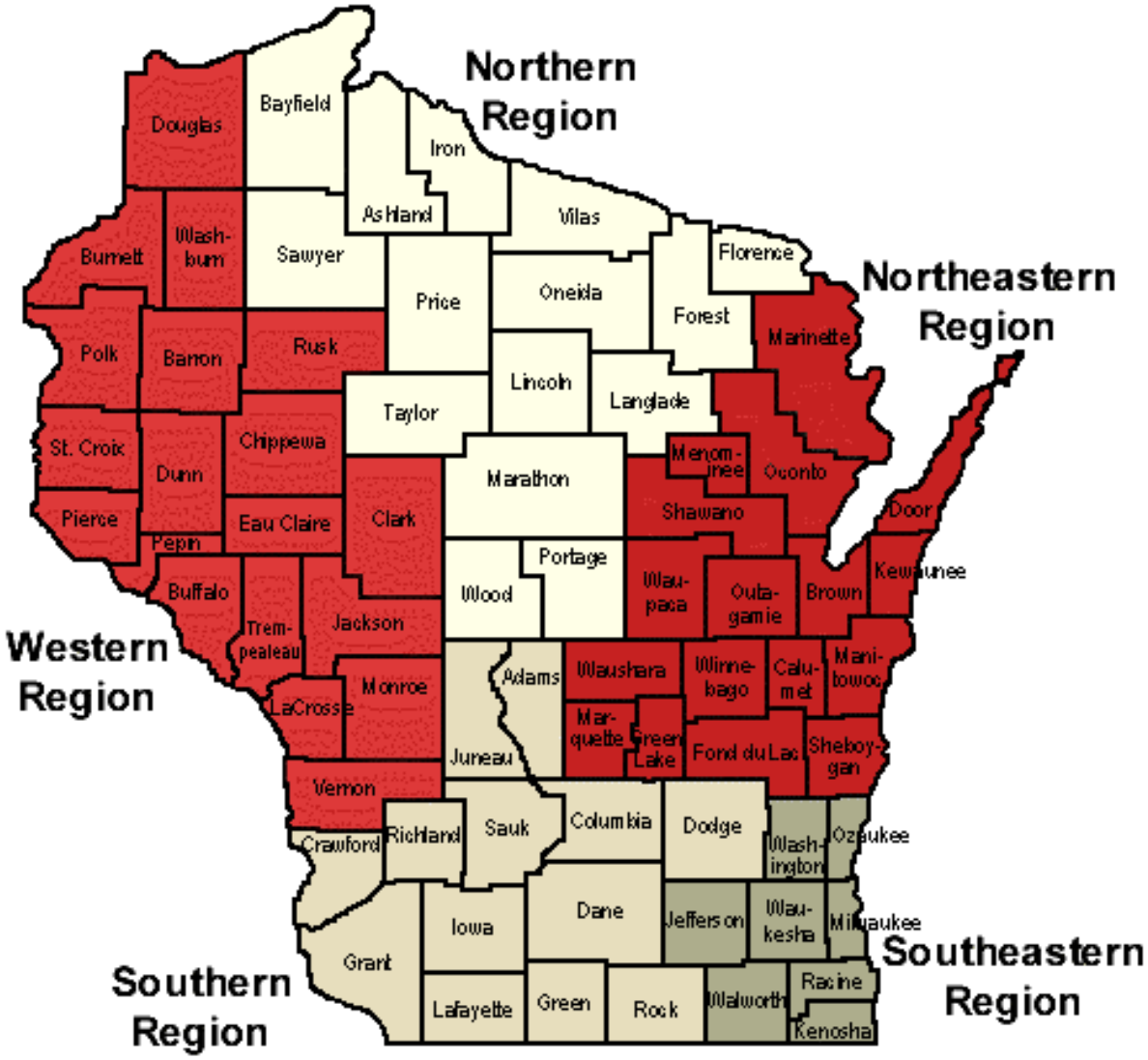
Cost information: Direct and indirect cost information is from the Centers for Disease Control and Prevention (CDC) and the American Diabetes Association.[5] Direct costs are defined as medical expenditures attributable to diabetes. Indirect costs are defined as those related to foregone earnings due to disability and mortality attributable to diabetes. The CDC used the following per capita estimates for determining costs: $5,885.07 for direct costs and $7,201.87 for indirect costs. Per capita estimates are applied to the (rounded) estimated number of persons with diagnosed diabetes for each county to determine the direct, indirect, and total estimated costs of diabetes in each county. Rounded county costs (direct, indirect, and total) are summed to determine costs for Wisconsin. For each county, costs are rounded to the nearest one-hundred thousand, and for the state costs were rounded to the nearest ten million. Cost information does not included estimated costs incurred by children (ages 17 years and younger).

Mortality data: Mortality data are from the Wisconsin BHI (1993-2000). Prior to 1999, causes of death were coded using the International Classification of Diseases, Ninth Revision (IDC-9). Beginning in 1999, causes of death are coded using the International Classification of Diseases, Tenth Revision (ICD-10). A diabetes death prior to 1999 is defined as the reporting of an ICD-9 code 250.0 – 250.93 in "Underlying Cause of Death" on the death certificate. A diabetes death in 1999 or 2000 is defined as the reporting of an ICD-10 code E10 – E14 in "Underlying Cause of Death" on the death certificate. These data adjust for the coding changes that occurred when using ICD-9 prior to 1999 to ICD-10 in 1999 and 2000. A comparability ratio based on ICD-10 data (from 1999 and 2000) was applied to the ICD-9 data (1993-1998); this in effect makes the data comparable throughout the time period. Mortality data includes deaths of all ages, and data are age-adjusted to the 1990 U.S. standard population.

Control of Type 1 and Type 2 Diabetes: Information on control of Type 1 and Type 2 diabetes is from the Wisconsin *Essential Diabetes Mellitus Care Guidelines*. The Wisconsin Diabetes Advisory Group developed the guidelines in 1998 and revised them in 2001.

Prevention of Type 2 Diabetes: Prevention of Type 2 Diabetes information is from the American Heart Association (AHA), the National Heart, Lung, and Blood Institute (NHLBI), and the Wisconsin *Essential Diabetes Mellitus Care Guidelines*.

The Diabetes Control Program, Bureau of Chronic Disease Prevention and Health Promotion, Division of Public Health, Department of Health and Family Services compiled data and information for this report. February 2002.



[1] Mayfield JA, et al. Assessment of diabetes care by medical record review. The Indian Health Service model. *Diabetes Care*. 1994 Aug;17(8):918-23.

[2] Self-reported prevalence of diabetes among Hispanics – United States, 1994-1997. *Morbidity and Mortality Weekly Report*. 1999 Jan 15;48(1):8-12.

[3] Bolen JC, et al. State-specific prevalence of selected health behaviors, by race and ethnicity – Behavioral Risk Factor Surveillance System, 1997. *Morbidity and Mortality Weekly Report: CDC Surveillance Summary*. 2000 Mar 24;49(2):1-60.

[4] Centers for Disease Control and Prevention. National Diabetes Fact Sheet: National estimates and general information on diabetes in the United States. Revised edition. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 1998. Website: http://www.cdc.gov/diabetes/pubs/facts98.htm 3/13/02.

[5] American Diabetes Association. Economic consequences of diabetes mellitus in the U.S. in 1997. *Diabetes Care* 1998 Feb; 21(2):296-309.